

**SB 1916 Advisory Committee**  
**May 21, 2003**  
**Auto Body and Paint**  
**Project Feasibility Report**

The purpose of this report is to present the results of a feasibility analysis that has led to our decision to develop a P2 program for the Auto Body and Paint (AB&P) industry. The report is presented in three sections: Executive Summary, Feasibility Study, and Project Design Possibilities including Potential Outcomes and Measurement.

## **Executive Summary**

This overview presents the results of a feasibility study that has led to the Department of Toxic Substances Control's (DTSC) decision to develop a pollution prevention (P2) program to address the auto body/auto paint (AB&P) industry. While toxic air emissions, released during the coating application process, are the primary environmental concern associated with AB&P shops, these shops also generate emissions and hazardous wastes from other shop operations. National, state and local agencies with jurisdiction over air quality recognize the environmental impact posed by coating operations and have responded by tightening limits on coating composition and application techniques. Progressive states recognize the link between pollution prevention and reduced emissions and have developed comprehensive training and outreach programs to assist AB&P shops with best management practices, new coating application and cleaning technologies, compliance assistance, and cost-benefit analysis tools.

Based on the findings of the following feasibility study, DTSC will develop a successful, results-oriented and measurable P2 program for the AB&P industry in California. DTSC will utilize existing resources, materials, and contacts, and will work with corporate partners from the paint formulation and AB&P industries, as well as state and local partners from ARB, local air districts, CUPAs, and Green Business programs.

### **Pro**

#### **Pollutants of concern**

Large volumes:

- The largest manifest categories for this industry sector are solvents.

CWC	Description	Year 2001 QTY(tons)
214	Unspecified solvent mixture	670
212	Oxygenated solvents	262
213	Hydrocarbon solvents	63.1

- Estimated VOC emissions per year = 4,700 ton/yr statewide

**The majority of P2 opportunities focus directly on these three largest pollutant categories which amount to 80% of the manifested waste.** See \*products, equipment and process related opportunities immediately below.

### Program-related opportunities

We briefly reviewed 16 federal, state, regional, and non profit auto body paint p2 programs. These opportunities these programs present for development of our program include a variety of elements, including such things as complete training programs, various checklists, cost-benefit analyses, product comparisons, etc (see attached feasibility analysis for a more complete list.)

### \*Products, equipment and process opportunities

Beyond the environmental benefit of reductions in manifested waste and volatile organic compounds (VOCs), product reformulations, new equipment, and process changes can also result in reduced liability, reduced employee exposure to harmful chemicals, increased worker safety, increased profits, and enhanced market positioning. Case studies support significant reductions in VOC emissions and waste manifested.

### Willing partners

We have willing potential partners such as MAACO, Ford, Dupont, PPG, and Sherwin Williams, NAPA, AAA, CUPA's, SCAQMD, ARB, and air districts. One CUPA has already shown an interest to help design and participate in an auto body and paint program.

### Same marketing strategies as VSR

Same market drivers and same market positioning advantage associated with VSR.

### Green Business

A Green Business Program connection can be developed with minimal effort that will open doors for support from some of the CUPA's and Region 9 EPA.

### **Con**

It will take quite a bit of time to develop a fully operational training program including training video, collateral material, etc.

### **Findings**

Based on this feasibility study, DTSC has determined that this project:

- Will address known environmental problems (air, waste);
- Includes known solutions;
- Has willing partners;
- Can build on models developed elsewhere (at least 16); and
- Can be cost-effective.

## Feasibility Study

The feasibility study is organized as follows:

1. Demographics/sector analysis
2. Waste generated and Volume
3. Regulatory issues
4. Sources-who did we contact for this study?
5. P2 options
6. Potential partners
7. Expected outcomes and measurement
8. Basis of decision to go forward
9. Project design possibilities

### 1. Industry Demographics and Sector Analysis

The AB&P industry falls under the Standard Industrial Classification (SIC) code **7532**. In California:

- There are **1,363 facilities with air permits** under SIC 7532 who are required to submit annual emission inventories to their local air districts. Source: ARB's CEIDARSII database
- There are 2,357 EPA ID numbers with SIC 7532. Note, though, that more than one EPA ID number may be assigned to a single facility and that not all of these facilities manifested wastes in 2001. Source: DTSC's HWTS database

The following nationwide statistics were from Southwest Pollution Prevention Website (<http://p2.utep.edu>)

In 1999, there were approximately 35,000 body, paint, and interior repair and maintenance shops in the U.S. Ninety-five percent of these were small shops employing less than twenty people. According to the 1999 County Business Patterns Economic Profile, these shops employed over 209,000 people and had an annual payroll of over \$5,910,200,000.

Owners:	Body shop owners are generally 35-49 years of age and most (68%) have some education beyond a high school diploma. The average body shop owner has been in the industry 23.9 years and most body shops (77%) are family owned.
Shops:	The average shop has been in business 19.1 years. Word of mouth/car dealer referral is the most popular source of business for these shops. The average shop employs 6.9 employees. Nearly 30% of shops have sales volumes of more than \$750,000. The average for all shops is \$543,424 (56% is attributed to labor and 44% is attributed to parts).

Material Use:	According to one study, approximately 60% of shops surveyed used just one brand of paint, and median monthly paint purchases exceeded \$1,000. Trade magazines and jobbers are the most common sources of information on new products. Quality is the most important factor influencing overall buying decisions (affecting decisions much more than price). On average, 35% of shops buying dollars are spent on crash parts, with paint (18%) second.
Operations:	Nearly 70% of shops have at least one employee who attended a training session in 1999. Almost 60% of the shops have at least one ASE-certified technician. A typical shop spends most of its time, about 42%, on body work. It spends about 34% of its labor hours on painting; 11% on mechanical repairs; and 13% on pulling, straightening, and measuring (bench time).

## 2. Wastes Generated and Volume

- Hazardous waste manifested- 1,249 tons/yr. Average one ton/per year/ per reporting shop
- VOC- Statewide 18 tons/day (conservative)
- VOC- Statewide 4,700 tons/yr (conservative)

### a. Wastes

- Paint waste (paint dust, paint sludge, leftover paint, masking materials).  
Pollutants:
  - VOCs (toluene, xylene, etc.)
  - Metals (lead, chromium, zinc, barium, cadmium, etc.)
  - Isocyanates
- Air emissions (VOCs, isocyanates, particulates, heavy metals; e.g., hexavalent chromium, cadmium)
- Thinners/solvents (From cleaning of spray gun and parts)
  - Toluene
  - Xylene
  - Methyl ethyl ketone
  - Methyl isobutyl ketone
  - Naphtha
  - Kerosene
- Antifreeze
- Batteries
- Floor cleaning wastes
- Paint Booth Filter
- Shop towels and other solvent/paint contaminated wastes
- Used oil
- Wastewater (hazardous?)

- Aged, off-spec, surplus materials
- Left over fillers

**b. Volume of Waste Generated Based on Manifest Data:**

CWC	Description	Year 2001 QTY(tons)
214	Unspecified solvent mixture	670*
212	Oxygenated solvents	262*
213	Hydrocarbon solvents	63.1*
222	Oil/water separation sludge	49.2
352	Other organic solids	36.9
133	Aq. Soln. With total organic resid. >10%	35.6
343	Unspecified organic liquid mixture	32.4
221	Waste oil and mixed oil	24.5
181	Other inorganic solid waste	11.6
223	Unspecified oil-containing waste	9.4
135	Unspecified aq. Soln.	8.4
134	Aq. Soln. With total organic resid. <10%	7.9
331	Off-spec, aged, or surplus organics	7.7
741	Liquids with HOC>=1000 mg/l	4.3
461		3.3
241		2.5
151		2.3
512		1.3
172		0.6
252		0.4
141		0.2
791		0.2
541		0.2
291		0.1
211		0.0
	TOTAL for CWC	1,233.6
	TOTAL for RCRA Codes (no CWC codes)	6.8
	TOTAL WASTES MANIFESTED	1,240.4

\* Waste Categories 214, 213, and 212 represent 80% of the total wastes manifested.

Comments on quantity generated:

1. This report is based on facilities that reported belonging to SIC 7532 – note that not all facilities reported an SIC code, so there may be several auto body shops that may not have been captured under this report.
2. Quantities are based on 2001 manifests.
3. If we compare SIC 7532's total quantity of 1,240 tons (year 2001) with the total of all industries' manifested waste in year 2000, which was 1,297,849 tons, SIC 7532's percent contribution would be about 0.1%.
4. Out of 2,357 facilities that were in the report, meaning having EPA ID numbers, only 1,283 manifested wastes in 2001.

5. Shops were grouped based on quantities of waste generated:

<u>Wastes Generated (tons)</u>	<u>No. of Shops</u>
21 - 90	1
10-20	4
5-9	26
1-4	306
0.1-0.9	787
0.001-0.09	159

6. No companies with industry code SIC 7532 are listed in DTSC's SB 14 Summary Progress Report database.

**c. Estimated VOC Emissions**

Assumptions:

1. 1.5 paint jobs per day per shop
2. 4.5 gal. of coating per job (1.5 gal. paint and 3 gal. pretreatment, precoat, primer, etc.)
3. 4.1 lbs. VOC per gal coating (based on averaged VOC limits of conservative air districts. Please see attachment.
4. In attainment areas the average lbs/gal for paint/hardener/reducer at a 2:1:1 ratio, is 5.75 lbs/gals. The estimate we are using, based on SCAQMD allowed emissions as a statewide average, is conservative.
5. There are 1,300 shops statewide with EPA ID Numbers

Amount of VOC emissions:

$$1,300 \text{ shops} \times 1.5 \text{ job/day/shop} \times 4.5 \text{ gal/job} \times 4.1 \text{ lbs. VOC/gal} = 36,000 \text{ lbs. VOC/day} \\ = 18 \text{ tons/day}$$

Estimated VOC Emissions per year = 4,700 tons/yr

### 3. Regulatory Issues

- CARB –Airborne Toxic Control Measure (ATCM) approved by ARB in 9/01, eliminated use of hex chrome and cadmium from automotive coatings. The measure allows the sale of noncompliant coatings manufactured prior to 01/01/03. Noncompliant products can not be sold after 06/30/03 or used after 12/30/03.
- Air District Regulations
  - Local air districts in the following 17 counties and regions have regulations pertaining specifically to motor vehicle (non-assembly line) coating operations:
 

South Coast	Sacramento
Bay Area	San Diego
San Joaquin	San Luis Obispo
Butte	Santa Barbara
Feather River	Shasta
Glenn	Tehama
Imperial	Ventura
Kern	Yolo/Solano
Mojave	

- The regulations establish limits for the amount of VOCs permitted in the various coating treatments for Group I vehicles (passenger-motor cycles to minivans) and Group II vehicles (public transit buses and mobile equipment). The limits were last updated between 1995 to 2000. The limits apply to the use of, specifications for, and sale of products within each jurisdiction.
- In lieu of meeting VOC limits on products, some district regulations allow alternative emission controls.
- The regulations all specify the use of HVLP equipment, electrostatic equipment, or coating equipment with equivalent (specified) transfer efficiency operated in accordance with manufacturer's instructions. Some regulations also specify hand application and electrophoretic dip coating as an acceptable way to coat surfaces.
- Some districts have placed restrictions on the VOC content of the solvents used to clean coating application equipment, and some state that they do the cleaning a closed system or using processes that collect or minimize VOC evaporation.

#### **4. Sources**

Sixteen state, federal, regional, and non profit organizations have successful p2 auto body and paint programs to evaluate and use as a basis for the development of our program.

#### **5. P2 Options**

Program-related opportunities for building the program:

- Program descriptions
- Complete training programs
- Various checklists, including compliance assessment and p2 opportunities
- Toolkit
- Success Stories
- Cost benefit analysis
- Equipment and supplies directories
- Awards programs
- Product comparisons
- AB&P FAQ
- Programs that focus on product reformulation to achieve p2 objectives
- Studies on factors that motivate owners of auto repair shops to implement change.
- Cost calculators to help small auto body repair shops determine if its beneficial to invest in various equipment including HVLP, laser touch, star training, small batch solvent distillation units, automatic gun wash units

Products, equipment and processes opportunities for building the program:

- New paint formulations. Case studies support huge reductions in VOC, up to 300%, and reduction in manifested waste, up to 40%.
- New equipment and paint application processes. Case studies support reductions in the amount of material sprayed by up to 40%, with cost benefit analysis showing paybacks as soon as 9 months, while maintaining paint performance.

- New clean up equipment (gun cleaning) can reduce VOCs by 75%, manifested waste by 50%, and reduce employee labor by 30% and has a payback as soon as 4.1 months. Note: gun clean-up is performed with solvents. The largest manifest categories for this industry sector are solvents.

CWC	Description	QTY(tons)
214	Unspecified solvent mixture	670
212	Oxygenated solvents	262
213	Hydrocarbon solvents	63.1

The above three areas have much potential for reductions in manifested waste. Six additional p2 opportunities for AB&P have been identified.

## **6. Potential partners**

We have willing potential partners such as MAACO, Ford, Dupont, PPG, and Sherwin Williams, NAPA, AAA, CUPAs, SCAQMD, ARB, and air districts.

## **7. Basis for decision to go forward**

Based on this feasibility study, DTSC has determined that this project:

- Will address known environmental problems (air, waste);
- Includes known solutions;
- Has willing partners;
- Can build on models developed elsewhere (at least 16); and
- Can be cost-effective.



# **Project Design Possibilities, Potential Outcomes and Measurement**

## **Design Possibilities**

The following are very general project design component possibilities:

- Training (including the opportunity to promote ARB's STAR/Laser Touch paint application training; possible opportunity for DTSC life cycle staff)
- Model shop marketing strategy
- Working with manufactures to introduce p2 products and equipment
- Technology solution diffusion (possible opportunity for DTSC tech dev staff to provide assistance)

## **Expected Outcomes and Measurement**

Based on the findings of our study and depending on the final structure of the program, it is our intent to achieve the following outcomes:

- a. Successfully reach 10% of the AB&P shops in California, (successful defined as p2 implementation to a predetermined threshold).
- b. Of the shops we successfully reach, we expect to reduce manifested waste by 25%.
- c. Of the shops we successfully reach we expect to achieve "better than" SCAQMD VOC emission results.

Baseline measurements will be established at the beginning of the implementation stage. Outcome/improvement will be measured at the implementation evaluation stage. This process may be substituted for a model shop type marketing incentive approach which rewards p2 implementation with State recognition.